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THE FARMER'S ADVOCATE.

Buttermaking and Marketing.—Prof. Robertson said every market pays the least possible price for any commodity. Our future market must be Britain, where the price is governed by competition of Australia and Denmark, both of whom have high reputations in the "Old Land." Our butter trade with Britain has been injured because of the poor quality so often shipped. We now have that to overcome, which can only be done by supplying a first-class article in first-class condition. Butter is at its best when four days made; therefore, it must be got to the consumer as soon after that as possible. If cold storage can be obtained to keep butter down to the freezing point of water, no deterioration of value will take place. It was, therefore, recommended to provide refrigerators at different points in Canada and in Liverpool, so that the butter need not be put upon the market during the hot months of July August and Sentember.

of July, August and September. This plan was objected to by Mr. Graham and others, on the ground that if a market is to be secured and retained in England, a constant supply must be provided in order that customers once obtained may be held.

It was recommended that a regular quantity of first-class creamery butter be sent to England weekly by refrigerator cars from the creameries to the sea, and that refrigerator space be secured in the coming fast liners to the British market, where a Canadian shall look after the proper disposition of the same by auction. Prof. Robertson was, therefore, asked to use his influence in securing the support of the Government in a movement of that sort; but the Convention did not go to the length (as announced in a Toronto paper) of committing itself to the general principle of Government bonuses to stimulate the butter trade.

Bacteriology.—Mr. J. W. Wheaton, Secretary of the Western Dairymen's Association, addressed the Convention on the "Relation of Bacteriology to Dairying." There are two kinds of bacteria in milk—one reproduced by division, the other by spore formation. The casein and milk sugar are suitable mediums for their development. It is found by experiment that in less than three minutes after milk is drawn from the cow, one-third of a cubic inch will contain upwards of one hundred thousand germs. These are all floating about in the atmosphere; the purer the air, the fewer and better are the germs. If milk-pails and cans are thoroughly scalded and kept in a sunny location, they, at least, will not foster germ life. Proper ventilation of the stables and the admission of plenty of sunlight will

do much toward keeping bacterial trouble in subjection. The bacteria that sours or ripens milk will not thrive in a temperature below 50 or above 140 degrees, and, except within these limits, milk can be kept sweet for a considerable length of time. Bacteria that produce slimy, red, blue, or other objectionable forms of milk, can mostly be destroyed at 212 degrees. Some of the bad flavors of milk come from the cow; these can be detected as soon as milked, while those that come from an external source will not be noticed for some time after milking, and will increase in influence the longer it is kept at an ordinary temperature.

Officers Elected.—President, D. Derbyshire, Brockville; First Vice-President, Mr. Wm. Halliday, Chesley; Second Vice-President, J. Miller, Spencerville; Directors, J. H. Croil, Aultsville; A. Campbell, Ormond; Chas. Johnson, Athens; John Sprague, Ameliasburg; A. A. Wright, Renfrew; A. A. Allan, Toronto; John S. Pearce, London; W. G. Walton, Hamilton; John Hannah, Seaforth; A. Wenger, Ayton; W. Snider, St. Jacobs; James Carmichael, Arva; John Seinkam, Wellesley; Secretary and Instructor, Mark Sprague, Ameliasburg.

Paying for Cheese-factory Milk.

[Paper prepared by Prof. Van Slyke, of Geneva (N. Y.) Experiment Station, for the Western Ontario Dairymen's Association.]

In response to the request that I should prepare a discussion of the proposition made by Prof. Dean in Bulletin No. 95, advising a somewhat radical modification of the fat-basis in paying for milk at cheese factories, I send you the following, in which I shall confine my statements to the following points:

(1) Is this proposition warranted by facts

(2) In whose interests is such a proposition made?
(3) What is the immediate effect of such a proposition?

Before taking up the first point, let us consider what the proposed modification is, and what object it is supposed to accomplish. Suppose two patrons furnish milk containing respectively 3 and 4 per cent. of fat, then under the regular fat-basis system one would receive three-sevenths and the other four-sevenths of the money received for the cheese made from their milk. The proposed modification would call three per cent., four, and four per cent, five, thus making nine shares instead of seven, of which one would receive four-ninths instead of three-sevenths. In other words, under the proposed change, one pound of fat in poor milk would receive more money than would one pound of fat in richer milk.

The object sought to be accomplished by the change is absolute justice, or greater justice than can be secured by any other system, on the supposition that a pound of fat in poor milk makes more cheese than a pound of fat in richer milk; and, moreover, that the cheese is of the same commercial value, whether made from poor or rich milk. This proposition is based on the claim that milk poor in fat not only makes more cheese per pound of fat, but that such cheese made from poor milk has an equal if not greater market value than cheese made from richer milk.

Now, coming to our first point:

(1) Is the foregoing proposition supported by facts? On what ground is the claim made that more cheese can be made from poor milk than from richer milk for each pound of fat? The two compounds of milk which are of most account in determining cheese-yield are fat and casein. Now, it is claimed we shall always find in poor milk more casein for each pound of fat than we shall in richer milk, and hence, a pound of fat in poor milk will make more cheese, because it has more casein associated with it.

I have this to say on this point: We have worked for three years on this question, and have carried on over 300 experiments, both at our Geneva Station and in numerous cheese factories. We have carried our work through the entire factory season, and have obtained the averages of many million pounds of milk, produced by many thousands of cows. We have also worked with individual herds of cows. As a result of this work, we are warranted in say-ing that, so far as our New York factory milk is concerned, we find on an average that within the limits of 3 and 4.5 per cent. of fat the variation of casein from a uniform proportion with the fat is insignificant. While there are marked variations in individual cases, we should do injustice more often than justice by trying to recognize variations from the general rule. The proposed change claims or implies that the rule is always the other way, that poor milk always contains more casein for its fat, and it makes no allowance for variations on any kind from such a rule. Granting, however, that the milk produced by Canadian cows is different from that produced by cows in New York, and that in the milk of Canadian cows the richer milk always makes less cheese per pound of fat than does milk poorer in fat,-how can we justly pay the same for a pound of fat in rich milk as in poor milk? Under such circumstances, *quality* as well as quantity must be considered. If a pound of fat in boor milk makes more cheese than does a pound of fat in richer milk, it is due to the larger proportion of casein contained in the poorer milk. The in-creased yield per pound of fat is due to an increased amount of casein per pound of fat in milk. The results will be a cheese richer in casein, and hence, poorer in quality and market value. On an average, case in is worth $2\frac{1}{2}$ cents per pound; milk-fat, 25 cents. The proposition under discussion is practically to make the value of casein equal to that of milk-fat; whereas, its presence in the cheese in increased quantity makes a poorer cheese, under the same condition of manufacture. This is simply the old question, in a modified form, of paying for casein more than it is worth. Now, the experimental data, which have largely been instrumental in establishing the fact that cheese made from milk richer in fat is worth more than cheese made from milk poorer in fat, were furnished by the investigation of your own Prof. Robertson, working with Messrs. Bell and Ruddick. Their work was done only two or three years ago. and it is a matter of no small surprise that the Bulletin of Prof. Dean should have so completely ignored Prof, Robertson's results, especially when the latter had at least ten cheeses for every one contained in the Bulletin under discussion. On page 5 of the Bulletin, we find that the cheese made from milk poor in fat scored higher than the cheese made from milk richer in fat. These results, carried to their logical conclusion, would make skimmilk cheese worth more than whole-milk cheese, since they indicate that the less fat and more casein the higher the cheese scores. This may furnish an daily.

explanation of the high quality of the cheese sent by Canada to the World's Fair, since milk on our side averages somewhat higher than yours. In our next competitive test, we shall endeavor to use the poorest milk we can find, and shall confidently expect to take all the prizes from you.

I may add, however, that the results secured by Prof. Robertson harmonize with the work done at no less than five different experiment stations in the United States.

Let us now consider briefly the second point:

(2) In whose interests is the proposed change made ?

Is it demanded by the majority of intelligent dairymen? Is it called for by the dairymen who have done most to build up Canada's dairy interests? Take the progressive dairyman;—is he impatient for the change? Not at all. This proposed change is made solely in the interests of the producers of poor milk. Has not this class of dairymen had the ad-vantage long enough? For a whole generation they have been sharing the profits earned by their better neighbor dairymen. Even if some slight advantage may accrue to the producer of richer milk on the regular fat-basis system of payment, -- a point which we do not for a moment concede,—it would take a century to get back the money that has already gone into the pockets of poor milk producers under the old system. It remains yet to be proved that facts will support any such change. Any slight absence of absolute equality under the regular system would not be corrected under the proposed change, because this change is based on claims not established, and assumes that what may sometimes be true is always true. In our work during the past summer with different factory herds of cows, we have found poor milk, containing about the same amount of fat, differing in proportion of casein to fat as much as the poorest and richest milks. How would such cases be helped by this proposed change? A similar case occurs in Prof. Dean's Bulletin; taking May 7 and June 6, the milk contained just the same amount of fat (3.19 per cent), as shown on page 10, and yet one milk made 9.19, and the other 9 92 pounds of cheese, the difference being due to more casein in one.

Coming now to the last point I shall discuss: (3) What is the immediate effect of such a proposition?

The first effect is to cast doubt upon the whole system of paying for fat in milk for cheesemaking. The producers of poor milk, who are always and everywhere the "kickers" against the fat-basis system, are only too glad to lay hold of any excuse for overthrowing a system that takes from them money which they formerly received, but which in justice belonged to others. They dwell simply upon one point—the unfairness to them of the fat-basis system; not upon the slight amount of injustice, if there is actually any. The proposed change will in this way work more injury than it possibly can good, allowing that it would completely render justice to every individual.

Last year, at Ingersoll, I talked with young Mr. Ballentyne, who to'd me of this plan, and also the reasons why he adopted it. His reason was simply this: a pound of fat made more cheese in May that year (1893) than later in the season when the milk was richer, the yield going down somewhat as the season advanced. Hence, he reasoned, if we take herds of cows at any one time, or for an average of the whole season, the milks of different quality will vary as the milk does from month to month during the summer. Under normal conditions this

Dairy Farmers' Clubs.

Mr. Andrew Pattullo, Woodstock, President of the Western Ontario Dairymen's Association, writes us as follows :-- "I have read with very great in-terest the account you give of the Bothwell Dairy club. I, myself, have been urging the formation of such clubs at every cheese factory and every creamery in the country. I did so at the Eastern Dairymen's convention and at the creameries meeting, and at smaller meetings of farmers which I have attended recently. I hope you will use the powerful influence of the ADVOCATE to make the organization of dairy clubs general. Our big conventions have done an immense amount of good, but perhaps more has been accomplished by the district or local meetings which were held dur-ing the past two years throughout different parts of Western Ontario. Still we have failed to get at the patrons who most need to be inspired to right effort. We have been working in their direction at the annual metings of the factories. It seems to me much would be accomplished if we could only organize the patrons at our factories into dairy clubs for self help, self instruction, and friendly emulation with those of other factor-ies. I believe the Bothwell people have really started a great movement, and one which the ADVOCATE can do a good deal to promote.

Aside from the danger of burning the barn, smoking should never be permitted in the cow stable, because the fumes of the tobacco are certain to get into the milk, and thence into the butter, and depreciate its value. If you must work in the dairy barn before daylight or after dark, see to it that there are safe and substantial fixed lights, and then let those be the only lights there, for lanterns are almost as dangerous as pipes. during the summer. Under normal conditions this reasoning would hold good, but I pointed out in my address last year that the drought prevailing in 1893 affected the milk, making the casein actually decrease for awhile, when the fat increased. The facts observed under these abnormal conditions formed the original basis of this proposition. Similar conditions prevailed during 1894, and the same facts were noted in our experience.

SUMMARY.

Reviewing the points upon which we have touched, we feel warranted in saying that the weight of known facts does not justify us in the belief that any stricter justice would be rendered under the proposed change than under the regular fat-basis system, because if different milks vary in quantity of cheese produced per pound of fat, such differences will be compensated for by differences in the quality of the cheese produced.

The proposed change is solely in the interests of the producers of poor milk, and will create dissatisfaction with the fat-basis system, because the producers of poor milk will make it an excuse for returning to the old system. Any plan which encourages the production of poor milk, or which fails to encourage constant improvement in milk production, should be unhesitatingly condemned.

Mr. James Peter, Berkeley, Gloucestershire, explains, in the North British Agriculturist, his system of using carbolic acid as a preventive of abortion in cattle. "Commence by mixing with sufficient hot water to make a bran mash, $\frac{1}{2}$ oz. ordinary crude carbolic acid, then add the bran, gradually increasing the carbolic acid up to $\frac{1}{2}$ oz., which is the maximum quantity I can get a cow to take in a bran mash. For a number of cows, I measure out the requisite number of $\frac{1}{2}$ -oz. doses, and mix with water and bran in a fodder barrow, and then give a good, broad shovelful to each animal. Before I goi rid of the disease I administered the carbolic mashes three times a week. I find it equally safe to give an animal a $\frac{1}{2}$ -oz. dose